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ABSTRACT

Described in this report is a study which was undertaken in Wisconsin to evaluate the effectiveness of the Parent-Child Nutrition Education Project. A review of literature dealing with parent-centered approaches in education is provided. The study's focus, its methodology, its training of parents and data collected from pre and post tests of the children and parents who participated in the project are described and discussed. Findings indicate that the effect of training with a parent-child interaction component was positive. Recommendations for the development of nutrition education programs with a parent-child interaction component are outlined. (EB)

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FINAL REPORT

THE PARENT-CHILD NUTRITION EDUCATION PROJECT

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December, 1976

UDO 19192

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FORWARD

Due regard is owed to the Extension Home Economists and 4-H and Youth Agents as well as the program assistants in Brown, Racine, and Outagamie counties for their participation in the EFNEP family project. This pilot study could not have been undertaken without their assistance and enthusiastic support. Special thanks are given to the home economists and youth agents for their joint participation in teaching and material development. Program assistants should be thanked for the vital role they played as link with program families. The constant evaluation of training and materials by county staff proved valuable in planning successive lessons to be more useful and more relevant to needs and interests of EFNEP.

Other people who made valuable contributions to the project are the Home Economics Program Leaders in the Northeast and Southeast districts and those who helped in preparation and analysis of the test instruments - Mary Dahlman and Arden Hardie. The entire project was made possible through the constant support of Marlys Richert - State Program Leader of Home Economics.

I. INTRODUCTION

Nutrition education in the United States has expanded greatly since the first nutrition classes were held in the early 1900's. (1) Content, format, and goals have been altered as new knowledge is discovered and new teaching methods are utilized.

Despite seventy years of organized nutrition education, poor eating habits are far from being eliminated. This is serious because of the many implications that nutritional status has for health. An estimated 30 percent of the American population is overweight. (2) The mortality rate is higher for overweight individuals and many will suffer from such diet-related diseases as maturity-onset diabetes mellitus, liver disease, and cardiovascular disease. (2) Undernutrition is not uncommon in the United States. (3) Low weight mothers tend to give birth to low birth weight babies who have a decreased chance of survival. (4) Undernourished individuals are more generally tired, unable to concentrate, and prone to disease. (5,6) Furthermore, nationwide food consumption surveys have indicated a decrease in the average intake of certain nutrients. (7) In effect, the American eater may be less than optimally nourished in the midst of plenty.

Nutrition education has an important role in changing poor food habits by providing the consumer with information necessary to select a nutritious diet. (8) (3) This information is universally needed regardless of income, geographic location, cultural, social, or economic pattern or level of education. (9) Unwise food choices are made by individuals of all factions of society. But it is those persons with limited incomes who suffer most from ignorance of nutrition because their margin of safety is the smallest. (9) (3)

The need for effective nutrition education programs is apparent. Unfortunately, many past programs have had little effect beyond short-term changes in cognitive

ability. (10) Research in nutrition education is necessary to discover how to effect such a transfer; to find the missing link between nutrition education and its goal of establishing nutritionally sound food habits. (10) (11)

One nutrition program which has made some apparent success among low income families is the Expanded Foods and Nutrition Education Program. EFNEP, a part of the United States Department of Agriculture, is presently operating in 50 states. EFNEP was developed as a resource for low income families. The program was based on the assumption that the most beneficial environment for learning for low income parents would be in their own home working one-to-one with a trained but non-professional person. Program assistants make home visits to program families (who volunteer to be involved in EFNEP) about twice per month. Topics such as meal planning, food sanitation, nutrient requirements, gardening, and food preservation are discussed with the homemaker. Print materials are distributed to families. Program assistants also help the homemaker to be aware of the various resources available to the family (eg. food stamps).

The apparent success of EFNEP may be explained by its format of home visitation by a paraprofessional. This allows for a trusting relationship to be developed sooner and a larger degree of individualization of learning to occur.

Application of general principles from the field of education can be made in the teaching of nutrition. Among the recent trends in education is the move from the child-centered approach to the parent-centered approach. A number of training programs are utilizing the natural role of parents as teachers of their children and crediting their effectiveness to this approach.(12) In light of the role parents play in affecting the formation of food habits and the general nutrition status of their children, such an approach could be beneficial in nutrition education.

Research work was done in 1974-1975 in Wisconsin which looked at the effect of teaching homemakers similar nutrition lessons as those received by their children in after-school youth groups. The hypothesis of the study was that nutrition lessons taught concurrently to parents and children, would result in increased longevity of cognitive change and increased intake of the foods emphasized. Although the test results did not show this effect, the researcher states in the concluding remarks that:

> "The idea of parent-child education should not be abandoned, rather it should be realized that the coordination of lessons between school groups and the home is not enough to create an atmosphere for learning and cooperation between parent and child. The parent must be directly involved as an educator and taught basic principles of child development, as well as nutrition to be effective." (13)

The hypothesis that the parent must be directly involved in the education of children and be taught basic principles of nutrition and child development formed the basis for "The Parent-Child Nutrition Education Project." This pilot project was funded through the State of Wisconsin's Expanded Foods and Nutrition Education Program. The project utilized the parent-centered approach and evaluated the effectiveness of parents being directly involved as educators for their children.

II. LITERATURE REVIEW

A. The Parent-Centered Approach:

Many human developmental research studies have examined the crucial role parents play in the growth and development of their children and the general life style of their families. The majority of these studies done with low socio economic scale (S.E.S.) families have concluded two basic parental concerns: the deep concern for the general welfare of their children and the strong desire to improve their ability to cope with life. (14)

These conclusions have provided opportunities for parent-centered programs to evolve. The parent-centered approach is designed to utilize the family environ-

ment as the educational setting, with the parents being directly involved in the teaching process of their children. This model for family involvement focuses on the vital role parents play in their children's development. The objective of this approach is for parents to become effective participants in the teaching process of their children. This is accomplished by providing learning experiences for parents dealing with family development and suggesting specific parent-child activities. (15, 16, 17)

These programs designed to enable parents to become more effective teachers for their children have met basic difficulties and challenges. Low S.E.S. families may lack opportunities to attain knowledge about the general mental, physical, and emotional development of their children. Research in the field of parent education also indicates that low S.E.S. parents frequently experience anxieties and feelings of inferiority about their ability to succeed and feel controlled by outside events rather than being able to assert any controls of their own. (18) Sensitivity to failure by low S.E.S. adults may be due to a low self-concept resulting from unsuccessful experiences in school as children and lack of self-confidence due to their economic, social and/or psychological background. (19) Investigations in the field of adult learning suggest the need for an open and informal framework for the greatest success in learning. This informal teaching framework might best be provided in the individual's own home. (12)

With these factors in mind, researchers have explored ways of working with parents and children in their homes. Studies have found that it is possible to make parents effective teachers, by a series of home-visits over an extended period of time. Two examples of parent-child interaction programs using the home as a learning environment are listed below:

"Development of a Model of Family Involvement," University of Illinois-Urbana is utilizing a parent-centered program to teach mothers child management skills to enhance their children's cognitive and emotional development.

"Parents as Teachers," University of Florida is using the parent-centered approach to increase the qualitative interaction between mothers and their infants.

Additional advantages resulting from the implementation of this approach include: 1) a spill-over effect from a target child to other children in the family, a phenomena termed "vertical diffusion;" 2) parents living in proximity to families involved in intervention programs have become interested and tried to reproduce in their homes aspects of the program they have been able to learn about; 3) parents involved in the intervention program have reported success in other life situations (ie. improved home-management techniques, developed confidence to become involved in volunteer work or community-action groups) due to their enhanced level of interaction with their children at home. (12)

B. Formation of Food Habits:

Nutritional status is affected by an individual's pattern of eating (food habits). The formation of food habits is a complex phenomenon because it is a result of both objective and subjective factors. The objective factors include physical, biological and technological influences. The subjective factors include cultural, social, and pyschological influences. (8)

The predominant influence affecting the formation of food habits is the family. (20) A child's food habits are influenced by the availability of food in the home (objective factor). According to Lewin's Channel Theory, parents have a "gatekeeper" role in controlling the "channels" through which food comes to the table. They, thus, exert a direct influence on the food habits that their children develop. (21) This theory has become complicated by the results of more recent studies which have indicated a greater role by children than previously described in influencing food purchases made by their parents. Many food companies aim food advertisements at the "child consumer," realizing the effectiveness with which a child can "play his or her parent's hand." (22)

Parents also influence their children by the attitudes they demonstrate towards certain foods (subjective factor). Parents' food likes and dislikes correspond closely to those of a child (these correlations are also true for older siblings). (23, 24) Parents attach non-nutritional significance to foods when certain foods are used as rewards, punishments, or pacifiers for their children. (23) For example, a child may come to think of a sweet as special and more desirable than a vegetable when he or she must eat the vegetable to get the sweet. The atmosphere in the home at eating times, the way the food is prepared, and the manner it is served are also subjective factors influencing the attitudes a child has about food and eating, and the food patterns he or she develops. (8)

A program of nutrition education which is focused in the home would appear to be a very effective approach in the development of sound food habits for the whole family. Previous nutrition education programs have focused on the child in school or in youth groups. Without involvement of the family, which exerts such a strong influence on the child, the lack of successful long range effects is understandable. Involvement of parents could result in insight about the ways they can affect food habit formation and the significance of this for their children's well-being.

C. Focus on Nutrients:

Training materials for the experimental group of the pilot project were designed to focus on the functions, requirements, and food sources of the four nutrients Vitamin A, Vitamin C (ascorbic acid), calcium, and iron. Cooking methods which are important for maximum retention of nutrients were also included. There were two reasons for this focus.

1. Review of the literature indicated certain benefits of a nutrient approach as a technique for learning.
2. Review of diet studies in the United States indicated suboptimal intakes of several nutrients, most frequently Vitamin A, Vitamin C, calcium, and iron.

The "Basic Four" has been a popular technique for teaching nutrition for many years. This food groups approach has been described as a clear and straightforward tool that is easily understood and applicable to daily meal planning. However, some nutrition educators have criticized its clarity and straightforwardness for being non-motivating.

> "The food groups approach tells students what to learn and implies that this is all there is to know about nutrition. It is not based on students' questions and curiosity. Extensive use of the four groups is likely to have an adverse effect on the interest in nutrition. This traditional approach is inadequate to accomplish the desired results in nutrition education." (25)

The ability of the Basic Four to be applied to daily meal planning has also been challenged since it does not allow for the increasing complexity of food choices to be made by the consumer in todays market.

> "It is inadequate to cope with modern food technology's practices of fortification, synthetic nutrient enrichment, and fabricated foods." (26)

A teaching approach which focuses on nutrients has been suggested as an alternate to the food groups approach. It is felt that the nutrient approach would allow for the technological changes and would also increase the motivation to learn and apply.

> "If an individual receives background in nutrition information emphasizing knowledge of nutrient needs and best food sources of nutrients, he can use a discovery or problem-solving approach to select foods which will best assure his nutritional well-being. He can make up his own rules which will have meaning for him." (25, p. 113)

The nutrient approach, in summary, would be beneficial because of its greater adaptability to an ever changing food market and its greater motivational force for learning.

Various diet surveys have been made in the United States to obtain data on nutrient intakes of individuals. Nutrient composition of the diet is calculated and compared to a standard such as the Recommended Daily Allowances.

A review of diet surveys taken in the United States from 1957-1967, indicated that Vitamin A, Vitamin C, calcium, and iron were most often found to be low in American diets. (27) These values were related to income levels so that individuals among the lowest income levels had the lowest intakes of these four nutrients. (28)

Recent nutrition surveys indicate that nutrient deficiencies with severe clinical symptoms are rare in the United States. (5) Marginal deficiencies and undernutrition are not rare as evident from these surveys and affect to the largest degree, those of lower socio-economic status. Little is known about the long-term effects of marginal deficiencies and undernutrition, but these conditions have been implicated in preventing an individual from attaining his or her full potential in physical growth, academic achievement, and social adjustment, thus tending to perpetuate the "vicious cycle of poverty." (5) (8)

III. METHODS

A. Experimental Design

Three Wisconsin counties participating in the Expanded Foods on Nutrition Education Program were involved in this study. These are Brown, Outagamie, and Racine Counties. The counties were chosen on the basis of interest of county staff, support of state staff supervisors, and level of county participation in EFNEP.

The experimental group was composed of EFNEP families from Brown and Racine counties. The control group was made up of EFNEP families from Outagamie County. The training received by the program assistants in the experimental group was to be transmitted by them to the parent and then from the parent to the children.

The training received by the program assistants in the control group did not include a component for transmission of information from the parent to the child. The purpose of this type of control group, where training occurs but is not

like experimental training, is to control for the potential effect of the presence of the researcher in the county (just the continued presence of somebody new, no matter what was taught, could influence test scores).

The program assistants in each county were asked to select five families from among those with whom they were already working, to be involved in this project. Families met two criteria to be eligible for participation:

1. The family consisted of at least one parent and two children.
2. The two children were in two of the specified age groups; 4-6 years, 7-10 years, and 12-14 years. (These age groups were chosen to divide non-reading preschoolers from children attending school and to divide elementary school age children from junior high age chidren. The latter division was made to aid in the interpretation of test results, since the same test was used for both age groups).

The working experimental design called for a division of program assistants and the respective families into two groups in both the experimental and control counties. The model is illustrated in Figure I.

	Experimental Groups E-1*	(Brown & Racine Counties) E-2**
Pretest	X	
Training	X	X
Post Test	X	X

	Control Groups C-1#	(Outagamie Co) C-2##
Pretest	X	
Training	(X)	(X)
Post Test	X	X

*E-1 The families who were grouped into E-1 took the pretest, received the training with the parent-child interaction component and took the post test.

**E-2 The families who were grouped into E-2 did not take the pretest but received the same training as E-1 and took the post test. (This group would serve as a control for E-1 since it would check on any potential effect of the pretest on scores attained on the post test.

#C-1 The families who formed the C-1 section received the pretest, the training without the parent-child intereaction component and the post test.

##C-2 The families who were grouped into C-2 did not take a pretest but received the same training as C-1 and did take the post test.

Figure I Experimental Design employed in EFNEP family project

The initial experimental design called for a division of families into two additional groups in both experimental and control counties. See Figure II. In actual practice, it was not possible to obtain a large enough sample size.

	Experimental Groups E-3*	(Brown & Racine Counties) E-4**
Pretest	X	
Training		
Post Test	X	X

	Control Groups C-3#	(Outagamie Co.) C-4##
Pretest	X	
Training		
Post Test	X	X

*E-3 The families who were to be grouped into E-3 would take the pretest and the post test but would not receive training other than the usual training. Their respective program assistants would not attend special training sessions. A statistical analysis of the differences between the pretest and post test scores of families in E-3 would be made to note the effect of "time passing." Certain events may occur naturally with time which could influence post test scores (TV program or national nutrition campaign). Should a significant difference be noted in the E-3 group, this should be taken into account when interpreting results from the analysis of pretest and post test scores in E-1.

**E-4 The families who were to be grouped into E-4 would take the post test but would not take the pretest or receive any training other than the usual training. Their respective program assistants would not attend special training sessions. A comparison of post test scores attained by persons in E-4 with those in E-3 would be an additional check on the potential effect of the pretest on the post test. A comparison of post test scores attained by persons in E-4 with those in E-2 would be another check on the potential effect of time passing.

#C-3 The families who were to be grouped into C-3 would take the pretest and the post test but would not receive training other than the usual training. Their respective program assistants would not attend special training sessions. An analysis of the differences between the pretest and post test scores of families in C-3 would be made to note the effect of "time passing" as in E-3.

##C-4 The families who were to be grouped into C-4 would take the post test but would not take the pretest or receive any training other than the usual training. This group would serve in a similar manner as E-4 which was to be an additional check on the potential effects of the pretest and time passing.

Figure II Additional Groups Included in Initial Experimental Design Employed in EFNEP Family Project

B. Evaluation Measures

A number of tools were used to help evaluate the effectiveness of the training in the experimental counties. A test was developed and given as a pretest and post test, logs were kept describing home visits by program assistants, program assistants rated the helpfulness of each learning activity used with the family, and changes in nutrient intake were determined by pre and post NARS forms (Nutrient Adequacy Reporting System).

The adult test was designed as a questionnaire in order to be more informal and not disrupt the trusting relationship between program assistant and parent. The test developed for the 4-6 year olds was also a questionnaire. The school aged children filled out the test independently. See Part 2 for samples of these measures.

C. Training

There were eight training sessions for each county which were focused on specific lessons and two training sessions which focused on the testing instruments for a total of ten training workshops. These ten sessions occurred over a five month time period from mid December to mid May.

Training on how to give the pretest and post tests occurred in all three counties. Program assistants were taught about interviewing techniques and practiced giving the questionnaires to each other during the workshop. Those program assistants who were not to give the pretest did not attend this part of the meeting to avoid a potential bias effect due to familiarity with test contents.

The teaching techniques used in the remaining training sessions were similar in the experimental and control counties. Attempts were made to keep sessions informal. The approach was "activity-oriented." Lectures were brief and for explanatory purposes. The program assistants participated in role-playing, problem-solving activities, and group discussions.

In both the experimental and control counties, Home Economists and 4-H and Youth Agents shared the teaching and material development with the research assistants.

The content of the training sessions in the experimental and control counties was not alike: there was limited coverage of the four "key" nutrients in Outagamie County as part of general nutrition training; there was no content dealing with child development in Outagamie and no component for teaching parents to teach their children.

1. Training in Brown and Racine Counties [experimental groups]

   The following is a list of the eight lessons.

   I. VITAMIN A/Misconceptions of Children's Development ("OLD WIVES TALES")

   II. VITAMIN A/Physical Development of Preschool Children (4-6 years)

   III. VITAMIN C/Mental and Personality Development of Preschool Children (4-6 years)

   IV. VITAMIN C/Review and Catch-Up

   V. CALCIUM/Physical and Mental Development of Elementary School Children (7-10 years)

   VI. CALCIUM/Personality Development of Elementary School Children (7-10 years)

   VII. IRON/Physical Development of Adolescents (11-14 years)

   VIII. IRON/Personality Development of Adolescents (11-14 years)

   The human development component was used to enhance the ability of program assistant to teach parents how to become effective teachers of nutrition for their children. It would be impossible for parents to be effective without a basic understanding of developmental levels. This component was seen as an essential tool food optional transfer of nutrition information and attitudes.

Certain elements were common to the lessons implemented in Brown and Racine Counties (experimental group).

a. Agree-Disagree Statements--Approximately 15 statements dealing with the subject of the lesson were presented to each member of the group for individual consideration. These served the purpose of initiating discussion. These materials were developed to provide the parent with the opportunity to discuss with the program assistant the following concerns:

1. The important role nutrition plays in everyone's development.
2. Specific child-adolescent development topics.
3. The crucial role parents play in their children's development.

b. Explanatory Statements--The agree-disagree statements were accompanied by a detailed explanation of each statement. Each program assistant was given a copy of the explanations to use as a resource in discussions with parents. It was felt that the parent received sufficient material without also receiving the explanatory statements so these were not duplicated for use with parents.

c. Activity Packets--Activity packets were developed to supplement lesson series. The purpose of the activities was to stimulate parent-child interaction. Some activities were chore-oriented but in a manner that could make the job more fun. Others took the form of games which taught nutrition concepts.

d. Recipes--A recipe which would be high in the nutrient being emphasized and low in cost was handed out at each lesson. The attempt was made to introduce unfamiliar but highly nutritious foods prepared in such a way that they might be accepted. Recipes were designed to be readable by children and easy to follow. They were to serve as a vehicle for teaching about

nutrient needs, functions, and food sources as well as appropriate cooking procedures.

During the course of the training period, the following teaching techniques were stressed to the program assistants:

a. Plan and organize for the individual family situation before each home visit.

b. Interact and teach each parent according to her/his own aptitudes, talents, and learning styles.

c. Encourage parents to develop their own adaptations of the learning materials to meet their family's needs.

d. Encourage parents to react to the learning materials and make suggestions for improvements or additional topics.

e. Be aware of personal emotional behavior when interacting with parents. Be confident, patient, understanding, and enthusiastic. (Personal attitudes "rub off" onto parents).

2. Training in Outagamie County [control group]

The following is a list of the eight lessons that made up the workshops in the control group.

I. General Nutrition

II. General Nutrition

III. Goal setting

IV. Logs-design

V. Logs-how to use

VI. Food Fads

VII. Weight Control

VIII. Weight Control

The training content was chosen based on requests from the EFNEP home economist and program assistants. Lessons were jointly prepared and presented by the research assistant and the home economist. The program leader from this district also participated in the teaching. Print materials were distributed to program assistants to supplement lectures.

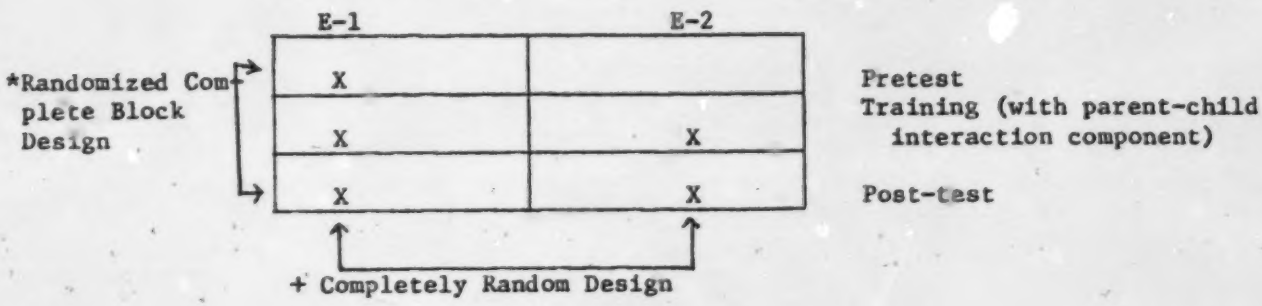
No materials were prepared for distribution to the parents. One concrete result of these training sessions was the development of a new log form that the home economist and program assistants felt would be very useful.

IV. GENERAL FINDINGS

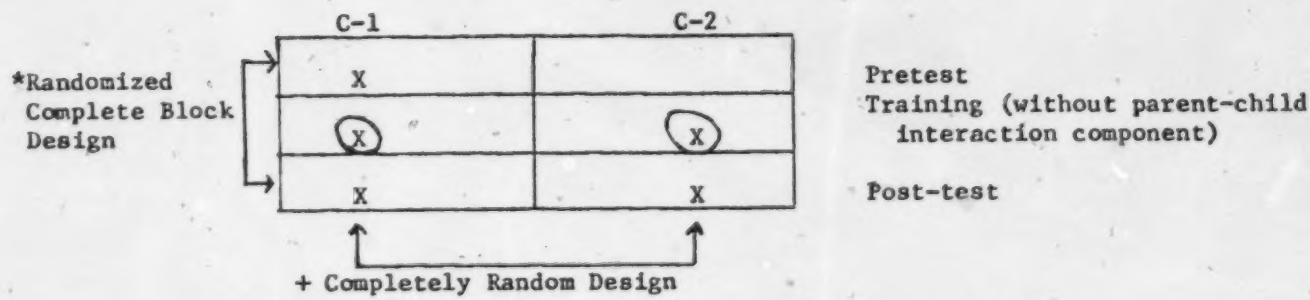
A. Pretest and Post-Test

Two statistical procedures have been completed to compare cognitive scores of the pretest and the post-test. See Figure III below:

Experimental Groups (Brown & Racine Counties)



Control Groups (Outagamie County)



*One analysis noted significant differences between pretest and post-test scores of E-1 and between the pretest and post-test scores of C-1. (E-1 is the group of families who took the pretest and post-test in Brown and Racine Counties, the experimental treatment counties. C-1 is the group of families who took the pretest and post-test in Outagamie County, the control treatment county).

The statistical model used in this analysis was the randomized complete block design. The F-test was used to note significant differences between mean percentage scores. For a more detailed summary of results and for an explanation of the models and tests used in the analysis, see Part 2 of the report.

+The second analysis noted significant differences between the post-test scores of E-2 and E-1 and between the post-test scores of C-2 and C-1. (E-2 is the group of families which took the post-test but not the pre-test in Brown and Racine Counties. C-2 is the comparable group in Outagamie County).

The statistical model used in this analysis was the completely random design. The F-test was used to note the level of significance of difference between mean percentage scores.

Figure III Statistical Procedures Used to Analyze Cognitive Tests

The results of the statistical analyses are summarized in the following tables. Table 1 indicates the results of analysis 1 comparing pretest and post-test scores of E-1 and of C-1. Table 2 indicates the results of the analysis 2 comparing post-test scores between E-1 and E-2 and between C-1 and C-2.

Although the results are not sufficient to serve as a "proof" on the effect of the training with the parent-child interaction component, it is indicative of certain trends. The following discussion states certain of the results and offers explanations for them.

TABLE 1.

Adult Test

1) The parents in the experimental group did significantly better on the post-test than they did not the pretest ($p < .01$), whereas the adult test scores in Outagamie did not change.

   This may be an indication of a positive effect of the training on the test scores. On the average, parents who received the training with the parent-child interaction component received a higher score than parents who did not receive this training. It is important in

TABLE 1. PAIRED DIFFERENCE BETWEEN PRETESTS AND POST-TESTS

	Sample Size	Mean Percentage Correct		
		Pretest	Post-Test	
ADULT TEST				
Experimental Group				
Brown County	20	47%	63%	**
Racine County	10	48	60	
Total	30	47	62	**
Control Group				
Outagamie County	10	59	59	
7-14 YEAR-OLD TEST				
Experimental Group				
Brown County	31	43	47	
Racine County	8	57	65	
Total	39	46	51	
Control Group				
Outagamie County	14	47	32	*
4-6 YEAR-OLD TEST				
Experimental Group				
Brown County	18	47	46	
Racine County	9	40	44	
Total	27	45	45	
Control Group				
Outagamie County	6	52	63	

* $p < .05$

** $p < .01$

future work to teach similar concepts to a control group. This will allow a more conclusive statement to be made about effectiveness of the experimental treatment.

2) The parents in Brown County showed a significant increase ($p < .01$) on the mean post-test scores whereas the increase in mean scores from pretest to post-test in Racine County was not significant even though the mean test scores differed by 12 percentage points. The small sample size in Racine County (N=10) and the large variance among individual scores were responsible for the lack of statistical significance.

7-14 Year-Old Test

1) There were no significant differences between the mean scores of the pretest and post-test of the 7-14 year-old test of the experimental group. However, slight increase was noted from the mean scores of the pretest to those of the post-test.

The slight improvement in mean test scores may be indicative of initial steps taken by parents towards becoming teachers of their children. Children were not supposed to receive direct contact with the program assistant, only with their parents. More research is needed to provide effective methods for program assistants to teach parents to teach their children.

It is also possible that the test itself was not adequate to demonstrate any changes in knowledge. More work must be done to validate the testing instrument.

2) In Outagamie County, the mean post-test score of the 7-14 year-old test was significantly lower than the mean pretest score ($p < .05$). The pretest may have adversely affected scores on the post-test. Perhaps the 7-14 year-olds were bored by the repetition of the test.

3) There were no significant differences noted between the mean scores of the pretest and post-test of 4-6 year-old test in either treatment group.

In retrospect the test was not felt to be a valid measure of the material taught in our experiment. In future studies it will be essential to check for congruence between testing measure and content of training.

TABLE 2.

Adult Test

1) There were no significant differences between the mean scores of the post-tests of the group of parents who took the pretest and of the group of parents who did not take the pretest. This may be an indication that, for the parents, taking the pretest did not have a significant effect on the score attained on the post-test.

7-14 Year-Old Test

1) The mean post-test score of those 7-14 year-olds who did not take the pretest was significantly greater than the mean post-test score of those 7-14 year-olds who did take the pretest. This substantiates the negative effect of the pretest on the post-test for the 7-14 year-old test discussed earlier. Those who took the pretest may have had less desire to complete the repeated test.

The effect may also be explained by possible population differences between the pretest and non-pretest groups. The sampling procedure was not random. Program assistants chose the families for involvement in the family project. A bias could have been introduced at this point.

B. Activity Evaluation Forms:

The activity evaluation forms were designed to find out which activities were used and to note their degree of helpfulness. This evaluation took place at the midpoint and end of the project. The program assistants were instructed to fill out the forms according to their impressions of the families' reactions to each activity used. (See Part II for the percentage of the program assistants that used each activity and the percentage of program assistants that rated each activity "very helpful.")

Table III shows discussion and activity materials which were used by 80% or more of the program assistants and were rated "very helpful" by 80% or more of the program assistants when used with their project families.

TABLE III. HIGHLY USED AND RATED MATERIALS

Training Session	Specific Content of Activity	% P.A. Used	% P.A. Rated "Very Helpful"
III.	Rip and the Vitamin C Story	93%	88%
III.	Cool Foods to Save Vitamin C	87%	95%
IV.	Vitamin C Game	93%	100%
V.	Calcium/Physical and Mental Development of the 7-11 Year-Old	86%	88%
V.	Mom's Helper	87%	95%
VI.	Calcium/Personality Development of the 7-11 Year-Old	80%	90%
VIII.	Physical Development of the 12-14 Year-Old	80%	80%

Other development discussion/activity materials were rated as "very helpful" to their project families but a smaller number of program assistants used them. This may be because the materials were not appropriate to specific

TABLE 2. COMPARISON OF POST-TEST MEAN SCORES

	Sample Size	Post-Test Mean Score E-1 (C-1)	Sample Size	Post-Test Mean Score E-2 (C-2)	
ADULT TEST					
Experimental Group					
Brown County	20	63%	16	69%	
Racine County	10	60	2	72	
Total	30	62	18	69	
Control Group					
Outagamie County	10	59	9	53	
7-14 YEAR-OLD TEST					
Experimental Group					
Brown County	31	47	30	61	*
Racine County	8	65	11	67	
Total	39	51	41	62	*
Control Group					
Outagamie County	14	32	36	45	*
4-6 YEAR-OLD TEST					
Experimental Group					
Brown County	18	46	17	47	
Racine County	9	44	1	38	
Total	27	45	18	47	
Control Group					
Outagamie County	6	63	17	51	

* $p < .05$

program families.

Lower ratings on the "helpfulness" scale given to each activity packet may be explained by lack of appropriateness to the specific ages of members of the families. Lower ratings in some cases may be explained by format problems, (ie. small print, too many items per page, and lack of color) and in sufficient "active" involvement of the child.

The nutrient-focused recipes designed to teach nutrition were used less and rated lower. The recipes may have been contrary to basic food likes of families. Another explanation for their low acceptance by the program assistants and families may have been format. The recipes may have been confusing to follow. Previous research has shown that low-income women may be resistant to experimenting with new recipes because of fear of food waste. Furthermore, the enjoyment of cooking may be lower for this group.

General recommendations for the development of future training activities are as follows:

1. A sufficient number of activities should be developed to allow for more individual choice.
2. Activities should be developed along "practical" lines, to facilitate naturally occurring events in the home.
3. The format of the activities should meet basic criteria:
   a) creatively designed to interest and appeal to families
   b) easy to do and relatively short in duration
   c) emphasize active and not passive behavior of family members involved

C. Log Forms:

The special log forms were developed as a means of continuous evaluation of the family project. The program assistants were to record their impressions of the parents' reactions to the training materials. Optimally, the program assistant was to fill out this log after each home visit. These forms were to be used in addition to the usual EFNEP county log forms.

In order to make a comprehensive evaluation of the project the research staff used the information recorded in either log form. Table IV shows the program assistants' impressions of how the parents felt about their involvement and the percentage.

TABLE IV. REACTION'S OF THE PARENTS TO PROJECT MATERIALS AS RECORDED BY PROGRAM ASSISTANTS

Type of Reaction	Specific Reaction	% of P.A. Recorded Reaction
Positive	Utilization of activity/discussion materials by the parent enhanced her interaction skills with her family.	33%
Positive	Introduction and application of the child-adolescent development materials increased the parent's understanding of her children's mental, physical and emotional development.	20%
Positive	Utilization of the nutrition activity/discussion materials increased the parent's understanding of academic nutrition and its application.	7%
	INVOLVEMENT IN PROJECT WAS BENEFICIAL	TOTAL 60%
Negative	Content of activities was irrelevant or unrealistic to the parent (age-related activities did not pertain to children or recipes were inappropriate to the family's food habits).	14%
Negative	Activities were too long and contained too much material to cover in a two-week period.	8%
	INVOLVEMENT IN PROJECT WAS NOT BENEFICIAL	TOTAL 22%
No Reaction	No positive or negative reaction from the parents in regard to their involvement in the project.	18%

Some specific comments recorded on logs on how the project was beneficial to the family are listed below:

"I think the activities are great, I'm learning right along with my kids!"

"I have enjoyed all the lessons, I go through all the materials with my children, it has brought us closer together."

"Through working and planning together, our family has fun and is much happier."

"The introduction of the child development stages has made me more aware of my children's capabilities. I am beginning to understand why my four-year old demands so much attention."

"The child development materials are very interesting and helpful, I need to be more aware of my children's needs for praise and recognition."

The information that was recorded in the logs seemed to indicate that the general reactions from the parents involved were positive. The majority of parents felt their involvement was beneficial. The major benefit expressed by the parents was the enhanced level of communication and interaction which resulted from their families doing the training activities together. The activities were thought to be an excellent start for the parent and children to learn, work and have fun together.

As shown in Table 4, approximately one-fourth of the parents felt they did not benefit from their involvement in the project. The general nature of their criticisms focused on the amount and content of the training materials:

* The activities are too long and come too often, I don't have the time to sit down and go through all the activities with my kids.

* It is too expensive to make mistakes, I won't make a recipe unless I know my family will like it!

* Activities should be more action-oriente to keep my kids interested and involved. There should be more puzzles and outdoor games.

The log forms indicated that the program assistants did not clearly understand that the activities explained and practiced during the training sessions were to be the "only" activities taught and demonstrated to their chosen families

during the project. Many times other activities such as newsletters and EFNEP lessons were used with the families in addition to or in replacement of the family project's activity material. This makes it difficult to evaluate the project's specific impact on the family. A reasonable explanation of the utilization of other materials is that the program assistants were often faced with situations where the project material was irrelevant to the family's immediate needs or interests.

It was also noted from the logs that in some cases the parent was not taught how to use the material. Many times the parent was not home and the program assistant, due to time restrictions, needed to drop off the activity packet, which resulted in the parent using the material with her family without prior explanation.

V. MAJOR CONCLUSIONS

1. The effect of training with a parent-child interaction component was positive. In general, parents who received training showed higher test scores than those who did not receive training. To be confident that parent-child interaction was the significant variable, it is important that the training content be controlled.

   a. The mean scores of the parents in Brown and Racine counties was significantly higher on the post-test than the pretest ($p < .01$).
   b. The mean score of the parents in Outagamie county on the pretest and post-test did not change.

2. Indication of initial steps taken by the parents who received the parent-child interaction component towards developing a "teacher" role for their children was noted:

   a. There was a slight increase in the mean score from the pretest to the posttest of the 7-14 year old tests.

b. Examination of the logs and evaluation of discussion/activity materials indicates positive response to this teaching method:

The majority of parents (60%) felt their involvement was beneficial to themselves and their families. Their involvement enhanced their interaction skills with their families and increased their understanding of their children's mental, physical and emotional development.

3. The two major criticisms of parents involved in the parent-child interaction component focused on the format type of activity and frequency of the training sessions.

a. The activities were sometimes irrelevant and unrealistic to the families because they were age-related and/or contrary to the families' basic food habits.
b. The activities were too long, and contained too much material for a family to incorporate in a two-week period.

4. The following recommendations for the development of nutrition education programs with a parent/child interaction component can be made.

a. The county staff, program assistants, and research staff involved should have their roles clearly defined in order for a trusting relationship to develop. During program planning, individual roles and responsibilities must be decided. Detailed explanation of the training's objectives and goals must be presented at the beginning of the project to satisfy the concerns and questions of those involved.

b. Content taught should be congruent with federal and state priorities for EFNEP families. It is desirable to use the competencies expected of graduating families as behavioral objectives for the lessons.

c. Evaluation measures should be emphasized as important means of rating the effectiveness of the training by the involved staff. The testing measures should be explicitly explained to the county staff and program assistants. The instruction of the testing measures should be elaborate. Optimally, staff members would work on a one-to-one basis with the program assistants.

d. Teaching techniques should be practiced extensively during the training sessions. Program assistants must be involved in behavior rehersals to insure that they are using the appropriate teaching methods with their families.

e. Activities should be creatively and simply designed and emphasize active behavior.

f. Activities should be developed in such a manner that individual family members has some choice in activities appropriate to his/her interests and age.

REFERENCES

(1) Whitehead, F.E. Nutrition Education for Children in the U.S. since 1900- Part I. II Journal of American Dietetic Association 33: 880, 1957.

(2) Mayer, J. Health. Litton Educational Publishing Inc. 1974 pp. 140-152

(3) White House Conference on Food, Nutrition, and Health. Final Report U.S. Government Printing Office, Washington, D.C., 1970.

(4) Shank, R.E. A Chink in Our Armor. Nutrition Today 5(2):2, 1970.

(5) Read, M.S. Malnutrition and Mental Development. A Special report prepared by Merrill S. Read Ph.D., Growth and Development Branch, National Institute of Child Health and Human Development, May 1969:2671.

(6) Madsen, C.H., Madsen, C.K., and Thompson, F. Increasing Rural Head Start Children's Consumption of Middle-Class Meals. Journal of Applied Behavior Analysis 7(2):257, 1974.

(7) United States Department of Agriculture (ARS). Household Food Consumption Survey, 1965-1966. Food Consumption of Households in the United States: Seasons and Year, Report No. 12, 1970.

(8) Livingston, S.K. What Influences Malnutrition? Journal of Nutrition Education 3(1):18, 1971.

(9) Mayer, J. Commentary. In Journal of Nutrition Education 2(2) Supplement 1:80, 1970.

(10) Whitehead, F.E. Nutrition Education Research. World Review of Nutrition and Dietetics 17:91, 1973.

(11) Bell, C.G. and Lamb, M.W. Nutrition Education and Dietary Behavior of Fifth Graders. Journal of Nutrition Education 5(3):196, 1974.

(12) Schaefer, N.E. Parent Centered Programs for Children. Public Health Currents January-February, 1976.

(13) Griffiths, M. An Evaluation of Concurrent Parent-Child Teaching in Nutrition Education. Master's Thesis, University of Wisconsin, 1975. p.68.

(14) Giesey, Rosemary, Forrester, B.J. "Home Visiting with Mothers and Infants: A Guide for Home Visitors", Demonstration and Research Center for Early Education, Peabody College, Nashville, Tenn.

(15) Gordon, Ira J. "Reaching Young Children through Parent Education", Early Childhood Education, 59, December 1971.

(16) Jones, Elizabeth, "Involving Parents in Children's Learning", Early Childhood Education, 59, December 1971.

(17) Gray, Susan, "The Child's First Teacher", Early Childhood Education, 59, December, 1971.

(18) Grabuwski, Stanley M. "Adult Learning and Instruction", Eric Clearinghouse On Adult Education, 47, 1970.

(19) Kuhlen, Raymond, "Psychological Background of Adult Education", Eric Clearinghouse on Adult Education, 1963.

(20) Lowenberg, M. The Development of Food Patterns. Journal of the American Dietetic Association. 65(3):263, 1974.

(21) Lewin, K. Forces Behind Food Habits and Methods of Change. In Report of the Committee on Food Habits, 1941-1943. National Research Council Bulletin, 108, 1943.

(22) Clancy-Hepburn, K., Hickey, A.A., and Nevill, G. Children's Behavior Responses to T.V. Advertisements. Journal of Nutrition Education 6(3):93, 1974.

(23) Eppright, E.S. et. al. Eating Behavior of Preschool Children. Journal of Nutrition Education 1 (1): 16, 1969.

(24) Beyer, N.R. and Morris, P.M. Food Attitudes and Snacking Patterns of Young Children. Journal of Nutrition Education 6(4):131, 1974.

(25) Poolton, M.A. Predicting Application of Nutrition Education. Journal of Nutrition Education 4(3):110, 1972, p.111.

(26) Picardi, S.M. and Pariser, E.R. Food and Nutrition Minicourse for 11th and 12th Graders. Journal of Nutrition Education 7 (1): 25, 1975, p. 25.

(27) Kelsay, J. A Compendium of Nutritional Status Studies and Dietary Evaluation Studies Conducted in the United States, 1957-1967. Journal of Nutrition, Supplement 1, part II, 99:119, 1969.

(28) United States Department of Agriculture (A.R.S.). Household Food Consumption Survey, 1965-1966. Food Consumption of Households in the United States: Spring, Report No. 11, 1970.